

# The Story of the North Atlantic Right Whale: Past, Present, and Future

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All living things are dependent on the resources provided by the natural world for their survival, and mankind is no different in that sense. Unfortunately, it *is* different in that it has learned to take more than the natural world is safely able to provide and has become accustomed to doing so. Up until about twelve thousand years ago, humans maintained the hunter-gatherer lifestyle that allowed other living things to survive alongside them. The destructive human excess that flies in the face of the rights other beings have to live was still unknown to the world. Then came the Neolithic Revolution - the general transition of man from a lifestyle in tune with the world's natural balance to one based on agriculture. The advent of agriculture set the stage for human civilization as we now know it and was a major turn of events in the history of the world. For the first time, a single species, no more deserving than any other species living on the planet, decided that it's needs and desires were more important than those of all the others sharing the Earth. For the first time, a single species reasoned that it's unimpeded growth and development at the expense of other things was acceptable and even desirable. From that point on, the stories of many other species on this Earth have been sad ones. Over the last few centuries in particular, the loss of global biodiversity has reached tragic proportions. Pursued to their extinction as resources for human development or chased to the edge of their habitats by sprawling human developments, thousands of species have been sacrificed for the sake of the powerful manifest destiny paradigm that guides our western civilization.

The plight of the North Atlantic right whale seems to be another example of the perpetuation of this unfortunate trend. They received their ironic name between four and five

hundred years ago because they were designated by whalers as the “right” whale to hunt. They lived close to coastal areas easily accessible by boats and had layers of thick, oil-rich blubber (Anderson, 2012). They also had six-foot, baleen feeding plates that could be of commercial value and floated once dead as if to facilitate easy collection by whalers (Ward, 1995, p. 172). Before hunting began, the North Atlantic right whale population could have numbered as many as eighty thousand animals. But that soon changed after whalers realized the opportunity they had at hand. Upwards of forty thousand whales were killed in one century after hunting began in the 1500s. With decimated stocks, the right whales of the Northern Atlantic were in danger of extinction by 1750 (Ward, 1995, p. 172). At one point in time, their stocks could have been as low as one or two-dozen whales (Anderson, 2012).

Today, despite being protected by international whaling laws, the right whale still finds itself threatened by human activity (Kraus et al., 2005). In the Northern Atlantic they number around a meager three hundred individuals, and their population is having trouble rebounding from widespread whaling (Knowlton & Kraus, 2001). Their population growth would be slow even without having suffered through a period of dramatic human overexploitation. As a K - selected species with long periods of gestation and parental care, they reproduce at an incredibly slow rate of one calf every three to four years (Ward, 1995, p. 172). However, heightened levels of mortality play a role in their continued status as a critically endangered species. Marine biologists who have studied the North Atlantic right whale widely agree with the 2001 paper written by Knowlton and Kraus when it states that “mortality and serious injury due to human activities, particularly commercial fishing and shipping, are thought to be significant factors limiting their recovery.”

Their increased vulnerability to these fates can be explained in great part by their migration patterns and biology. Coastal areas receive nutrients in runoff from land. This makes these regions more productive in terms of the growth of phytoplankton and, in turn, zooplankton (Friedland, Relyea & Courard-Hauri, 2011, p. 138). Consequently, North Atlantic right whales migrate to the coastal waters of New England in the late winter and early spring to feed on copepods, their preferred zooplankton prey (Parks, Warren, Stamieszkin, Mayo & Wiley, 2012). In the late spring, mothers visit Cape Cod Bay to feed with their calves (Ward, 1995, p. 173). During the 2010 migration the right whales made to Cape Cod Bay, 45% of their population was seen feeding there (Parks, Warren, Stamieszkin, Mayo & Wiley, 2012). Since studies began in the 1980s, there have been times when over 50% of the population has been sighted there at once (Ward, 1995, p. 173).

These factors would not be an issue, except for the fact that the region is used extensively for coastal and international shipping and plays host to heavy vessel traffic. The whales spend the majority of their time in this area feeding, and they do so right below the surface of the water where they cannot be seen, but where they are still vulnerable to vessel strike. Their swimming speeds, notably slow at four to six kilometers per hour, are not helpful in any attempts to get out of a boat's way (Ward, 1995, p. 172). According to a statistical analysis done by marine biologist Susan Parks and her colleagues Warren, Stamieszkin, Mayo and Wiley in a 2012 publication, the seasonal behavior of copepods makes right whales in Cape Cod Bay especially susceptible to vessel collisions during April. Boats could be warned of where whales are by listening for their vocalizations, but right whales do not vocalize while actively feeding (Parks, Warren, Stamieszkin, Mayo & Wiley, 2012). Their methods and choice of location for foraging seem to be designed to put the whales in danger of being hit by a ship. Of the fifty dead right whales

observed and reported since 1986, at least nineteen were killed by vessel strike (Kraus et al., 2005).

As if that were not enough of a risk, the high ecological productivity that brings the copepods and the whales to the eastern coasts of North America is the same thing that brings commercially valuable fish and fisherman to catch them. Fishing gear, like that used in pot fishing and vertical lines attached to surface buoys, are left fixed in the water column where the whales can become entangled (Anderson, 2012). In 1995, Nathalie Ward of the Stellwagen Bank National Marine Sanctuary reported that sixty percent of right whales observed in the North Atlantic bear entanglement scars - proof of cuts sustained from fishing gear that can lead to poor health (p. 175). Mortality levels due to fishing gear entanglement are lower than those due to vessel strike as far as the people studying right whales can tell. As opposed to the nineteen killed by vessel collision out of the fifty reported dead since 1986, only six right whales were confirmed killed by fishing gear entanglement (Kraus et al., 2005). However, mortality levels sustained in this manner are likely underestimated. Right whales that get tangled in fishing gear often drown and do not surface the way they usually do to be seen and reported. Furthermore, wounds obtained after encounters with fishing gear can result in long-term deterioration of health and eventual death long after a scientist sees and records that a whale has survived entanglement (Knowlton & Kraus, 2001).

Most of the evidence points to the idea that the future for the North Atlantic right whale is bleak, and that evidence cannot be ignored. Its population growth rate has been in decline since 1980, and the total population is currently decreasing (Kraus et al., 2005). The gene pool is limited and inbreeding becomes frequent with such low population numbers. This results in

weakened resistance to disease and ultimately, a positive feedback loop contributing to the whale's demise (Ward, 1995). In their 2001 report on North Atlantic right whale demography, Masami Fujiwara and Hal Caswell argue that the species may already be functionally extinct due to the struggle females have to find mates that are few and far between in the expanses of the Atlantic. They also note that mortality among mother whales has increased, and that as a result, average whale life expectancy and the expected number of female reproductive events have gone down. A female that could have expected to live more than fifty-one years in 1980 could only expect to live a little over fourteen years by 1995. Consequently, the 5.27 reproductive events that were the average expectation in 1980 dropped to about 1.26 events in the same time period (Fujiwara & Caswell, 2001). With a population of only about three hundred individuals, that loss of reproductive capacity represents a drastic blow to the North Atlantic right whale's population growth rate. The difference between one female producing five calves over the course of her lifetime and that same female only producing one is a great one when their stocks are so depleted. Recent increases in the per capita birth rate have been reported, but unfortunately they are not enough to mitigate the effects of the observed increase in whale mortality (Kraus et al., 2005).

The future of the oceans as a habitat for the North Atlantic right whale is in question as well. It is unlikely that the trend of ocean industrialization that earned the right whale the nickname "the urban whale" will change in the future. In addition to the heavy vessel traffic and fishing activity that goes on in North American coastal areas, illegal activities like ballast discharging, bilge pumping, and changing engine oil continue to alter and even damage the marine environments that the right whale calls home (Ward, 1995, p. 174). Changes in ocean temperature as a result of climate change bear considerable consequences for right whales in the

North Atlantic as well. Increases in temperature have a significant effect on the copepods they follow and feed on. Over the past forty years, copepods accustomed to certain temperatures in the Northeastern Atlantic have shifted their range as much as a thousand kilometers north due to ocean warming (Graeme, Richardson & Robinson, 2005). Plankton, such as copepods, can easily shift their range because they are free floating and very sensitive to even the slightest of changes in the marine environment (Graeme, Richardson & Robinson, 2005). The right whales that prey on them, on the other hand, might not be able to shift their range to find them as quickly. They will likely have to shift their range in some fashion as their waters warm to avoid the overheating they suffer from with such thick blubber (Anderson, 2012), and the success they will have finding an appropriate migration range is unknown. With this shift in copepod range observed by scientists comes a concurrent change in the timing of their peak abundances. Over the past forty - five years, a certain species of North Atlantic copepod has started peaking in abundance as much as eleven days earlier than usually expected. Its potential phytoplankton prey has been peaking even earlier than that, indicating a chance that the copepod population could suffer from lack of food (Graeme, Richardson & Robinson, 2005). If the peak abundance period for the copepods shifts away from the migration period of the right whale, the right whale could suffer from low abundance of an already inadequate food source.

A bleak outlook is no reason to be discouraged from making attempts at species conservation efforts. As said by marine biologist Rosalind Rolland in *The Right Whale: Urbanizes*, “the fact that right whales are here at all on this planet gives us cause for hope”. Making the effort to save individual species’ from extinction is an important part of working toward preserving global biodiversity. Through maintaining the current levels of biodiversity and working to improve them, we enjoy various ecosystem services of incredible importance. In

general, we see benefits ranging from the regulation of climate and biogeochemical cycles to crop pollination and “a number of miscellaneous services” (Meyers, 1996). The ecosystem services provided by the right whale may not be as easy to recognize as those of soil aerating worms or crop pollinating insects, but nevertheless the species has a role in maintaining the ecosystem of the Northern Atlantic Ocean. In its absence, another species would have to sustain the ecosystem by filling its former niche (Friedland, Relyea & Courard-Hauri, 2011, p. 107). Furthermore, allowing the right whale to go extinct in the waters off of our eastern coast would not only mean altering the balance of the marine ecosystem. It would mean giving up on a moral responsibility that we have as stewards of the oceans to change our ways for the benefit of the beings we share it with. There are so many efforts already in place to make the industrialized Atlantic Ocean a safer place for the right whale. Studies done by marine biologists cite the effectiveness of strategies ranging from altering shipping routes and legal boating speeds to limiting the amount of fishing gear fixed in the water column by streamlining the process of making fishing regulations. More technological solutions include mandatory reporting of ship location, the use of aerial surveys, and the tracking of zooplankton populations to predict where right whales will be (Kraus et al., 2005). But, even solutions as simple as making attempts to detangle trapped whales out at sea can make a difference (Parks, Warren, Stamieszkin, Mayo & Wiley, 2012). Humans have the capacity and the moral obligation to save the right whales of the North Atlantic. The only things that are missing are a sense of urgency and a willingness to make a collective effort. The story shared by the species that have stood in between humans and our desire for development is certainly a common one. But it does not have to be the story of the North Atlantic right whale.

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